Environmental Studies

2002

Yucca Mountain reclamation programs

2001

Department of Energy (DOE) scientists and technicians are studying Yucca Mountain, Nevada, to determine whether it would be safe to house a repository for spent nuclear fuel and high-level radioactive waste. While performing these studies, they must drill, trench, or clear some parts of the Yucca Mountain area. Scientists are trying to keep damage to plant and animal habitats at Yucca Mountain to a minimum while doing this work. However, in the course of its activities, DOE may disturb some of these environs and has promised to reclaim Yucca Mountain by restoring as much of the disturbed areas as practicable to their former conditions.

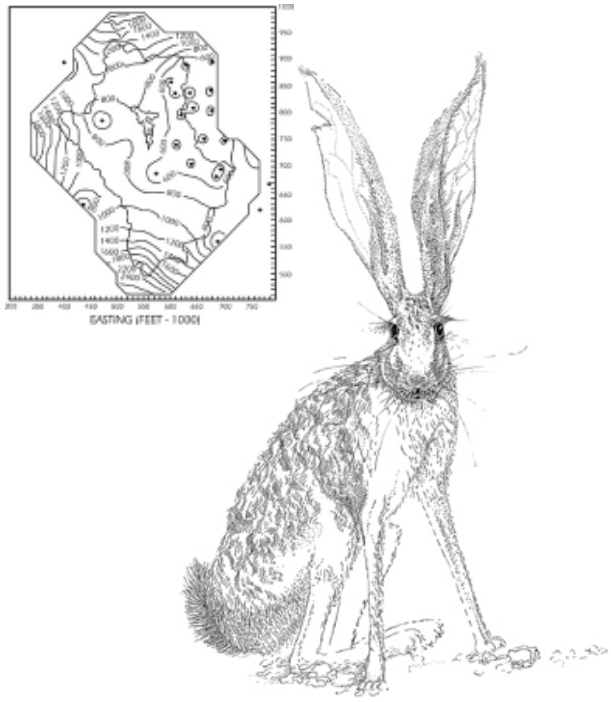
2000

To reclaim the mountain, DOE scientists must repair any damage to soils that have been disturbed. They also must develop the means to plant over any sites that have been disturbed. Because so little is known about restoring a desert environment to its natural state, DOE follows an extensive Reclamation Feasibility Plan during the course of its work at Yucca Mountain. The plan's purpose is to ensure that all appropriate steps are taken to restore Yucca Mountain to its former state whether or not the mountain proves suitable as a repository site. Some of the elements of the Reclamation Feasibility Plan are soil and plant surveys, site clearing, topsoil storage and management, erosion control, drainage control, recontouring, replanting, and post-reclamation monitoring.

1998

Soil and Plant Survey

Scientists have studied the soils and plants



at Yucca Mountain, and Yucca Mountain Project botanists and soil scientists have reviewed the findings of these studies. At some sites, though, they must still catalog and analyze plant and soil characteristics to provide answers to specific problems associated with this reclamation. For instance: Does the area contain plant and soil resources that can be preserved for later use? What, if any, species (endangered or otherwise) will be affected by the Project? What is the area's significance as a natural habitat? How can scientists lessen the negative effects of removing topsoils, which contain organic material important as a growth medium for plants? What other soils can scientists use during reclamation to replace topsoils? What kind of native plants can survive on reclaimed plots, and what do they need to thrive?

Clearing a site

Site clearing is the removal and preservation of resources from a disturbed area so they can be used later to help reclamation. These resources could include plants, soils, and other organic materials. Project scientists tailor their efforts to fit each site where they move earth or otherwise disturb the soil. In their efforts, they consider the location, size, and type of disturbance. Also important are the type and density of plants present, the amount of topsoil, and the best places available to store and preserve soil for later replacement.

Storing and managing topsoil

If topsoils are to be removed and put back later, biologists have to develop proper storage methods. They must protect soils from erosion and from the loss of the nutrients they contain. The best-known way to replace topsoil is to move freshly removed topsoil to another site that needs its own topsoil replaced. Unfortunately, this is not feasible for the Yucca Mountain Project. Scientists, therefore, have to find a way to stockpile their topsoils for short- (up to six months) and long-term storage.

Over the short term, Project botanists preserve their stored topsoils by spraying them with soil stabilizers to prevent erosion. Over longer periods, they plant over their stockpiles to provide additional protection. Botanists maintain their stockpiles in locations that offer maximal protection from erosion and other disturbances.

Controlling erosion

Erosion is a natural process. It is not the Project's intent to eliminate erosion in disturbed areas but to control it to the extent possible to minimize any harmful effects. Minor grading and shaping of disturbed sites (to preserve rainfall) are combined with a number of approaches to control erosion. For instance, temporary plants are placed to provide ground cover, and agents that hold the soil together are applied to ensure their continued safekeeping.

Controlling drainage

Project scientists have had to develop ways to minimize their effects on the quantity and quality of water in surface and groundwater systems in those areas disturbed by their studies. For instance, channels, ditches, culverts, and other structures divert water flowing from undisturbed areas away from disturbed areas to control drainage.

Recontouring

Recontouring is the act of grading or rearranging a disturbed site so it blends in with the surrounding landscape. This grading is done at Yucca Mountain to restore natural drainage patterns and maintain the original degree of steepness. Recontoured surfaces are roughed by ripping or disking with various machines to permit better contact and stability between the surface and soil materials applied to topsoil.

Replanting

Replanting disturbed areas is a complex process dependent on natural conditions not easily controlled. Rainfall becomes a vital factor in desert revegetation, and scientists must take measures to optimize available moisture. Whenever possible, they only replant plants native to the region. Presently, a series of field programs, coupled with an ongoing review of existing revegetation studies, is used to ensure proper replanting.

Monitoring after reclamation

DOE scientists will develop a set of criteria to measure the success of all reclamation efforts. They will look at several different parameters such as the percentage of plants growing as ground cover and the soil's ability to sustain plant life. Scientists will visit and test reclaimed sites periodically according to these parameters.

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

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DOE/YMP-0398
June 2000